

Governor's Drought Advisory Committee

April 20, 2011

National Weather Service

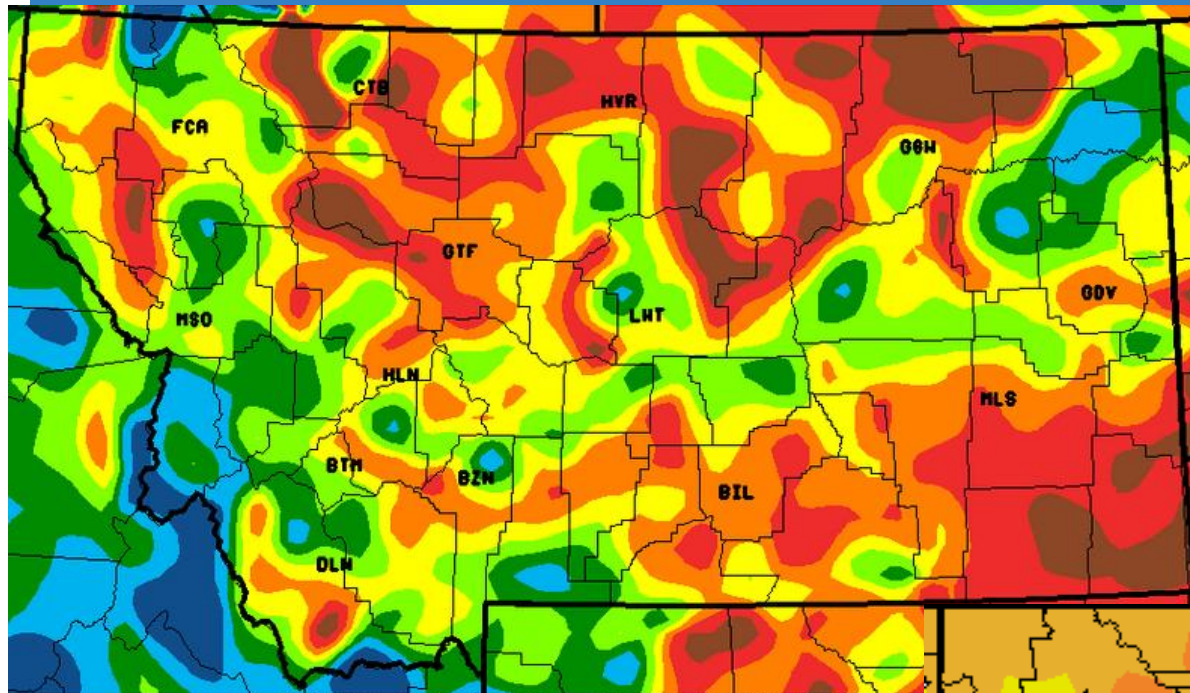
Gina Loss



Glasgow Flood

April 16, 2011 Glasgow, Montana

Percent of Normal Precipitation October 2010



October 2010 Percent of Normal Precipitation
Period of Normal: 1971-2000

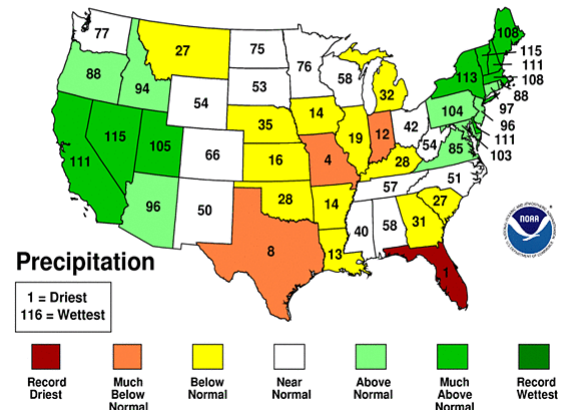
20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.noaa.gov>

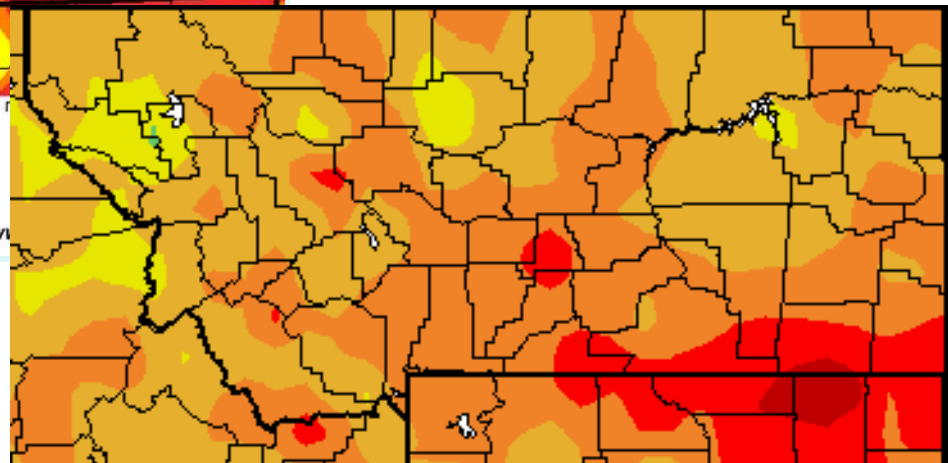
October 2010 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA

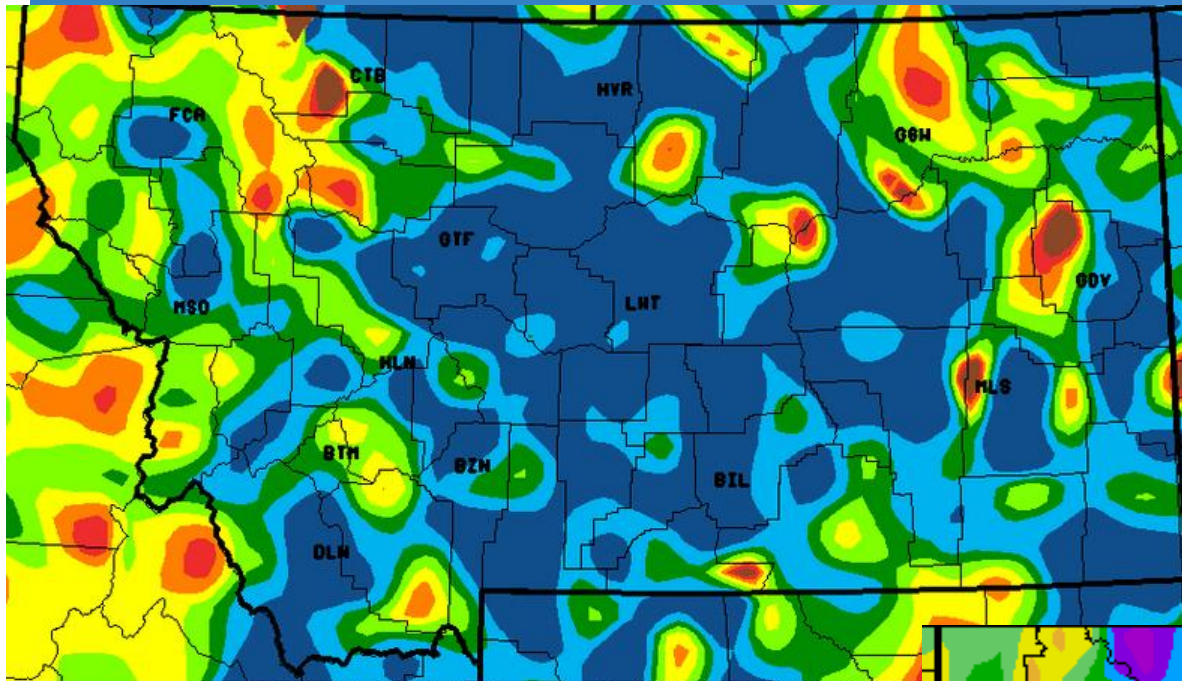


27th driest, 89th wettest

Departure from average
temperature



Percent of Normal Precipitation November 2010



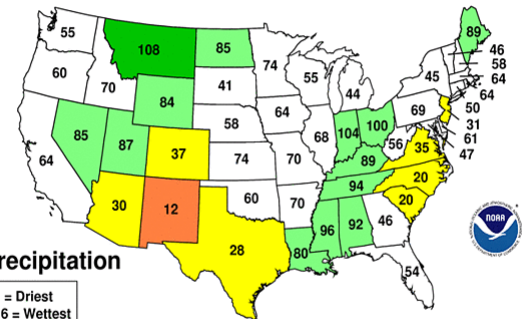
November 2010 Percent of Normal Precipitation

Period of Normal: 1971-2000

20 40 60 85 115 150 200

November 2010 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



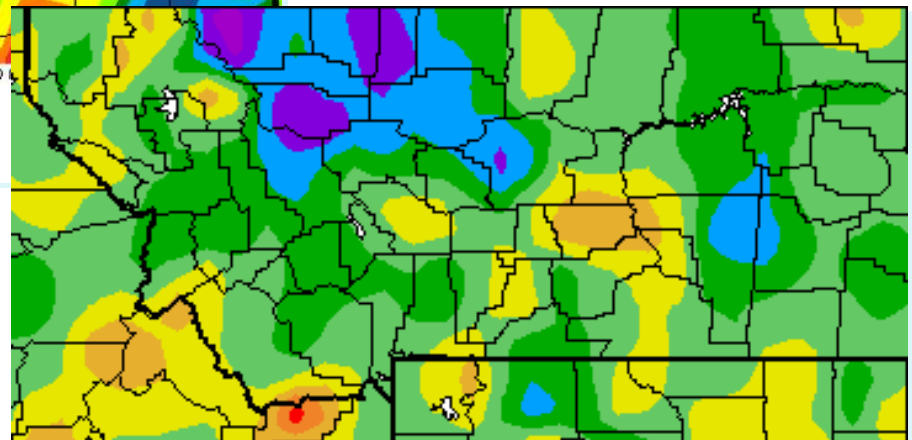
Precipitation

1 = Driest
116 = Wettest

Record Driest Much Below Normal Below Normal Near Normal Above Normal Much Above Normal Record Wettest

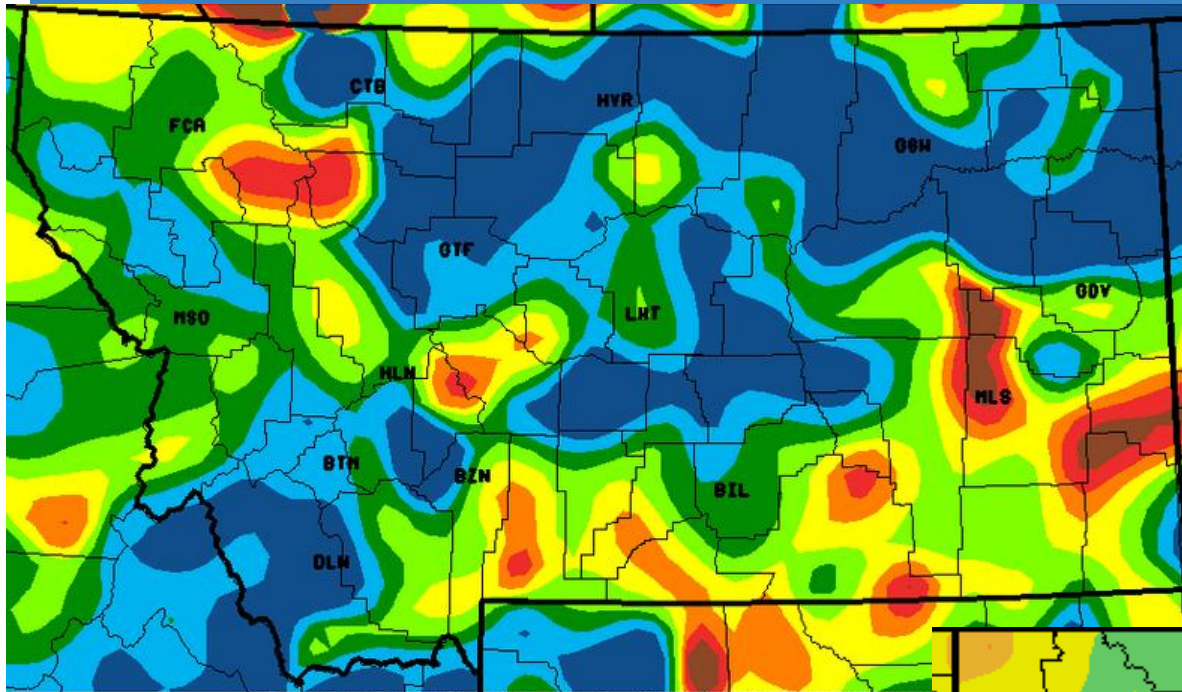
9th wettest, 108th driest

Departure from average
temperature



-10 -8 -6 -4 -2 0 2 4 6 8 10

Percent of Normal Precipitation December 2010



December 2010 Percent of Normal Precipitation
Period of Normal: 1971-2000

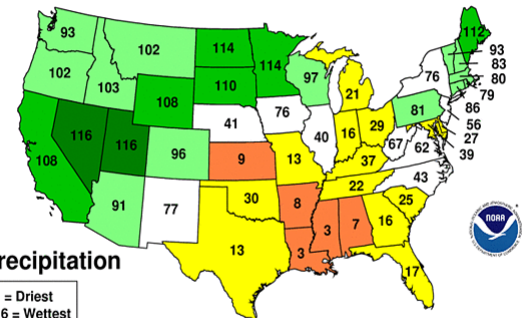
20 40 60 85 115 150 200

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<http://www>

December 2010 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



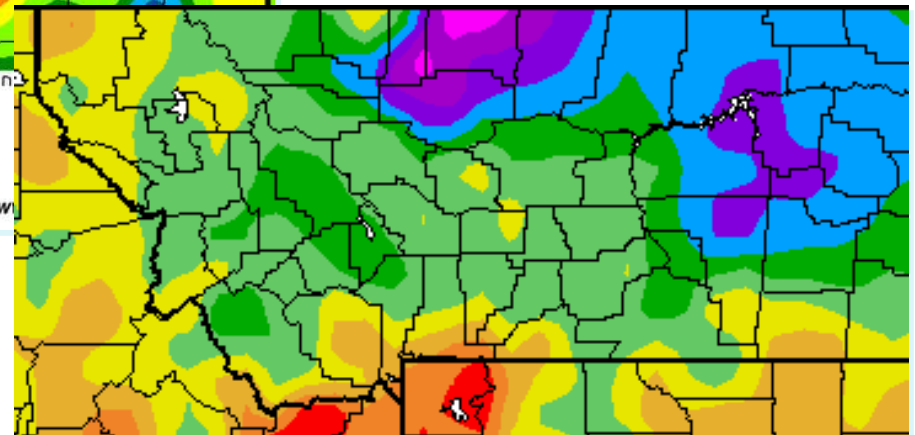
Precipitation

1 = Driest
116 = Wettest

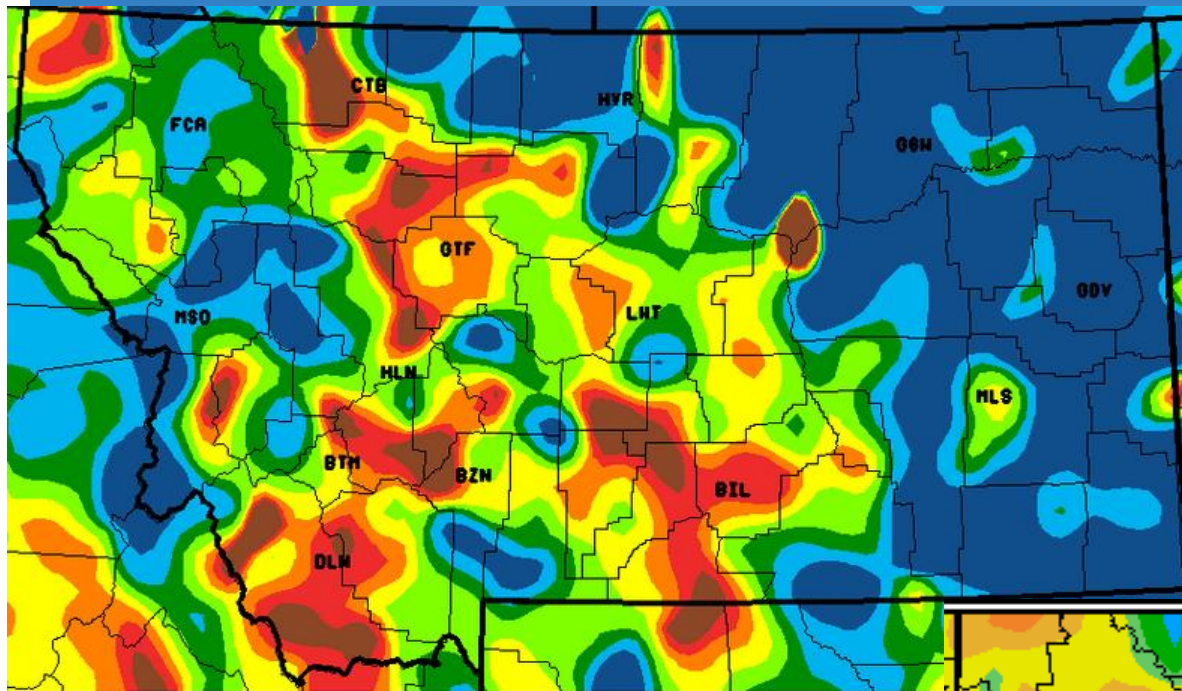


15th wettest, 102nd driest

Departure from average
temperature



Percent of Normal Precipitation January 2011



January 2011 Percent of Normal Precipitation
Period of Normal: 1971-2000

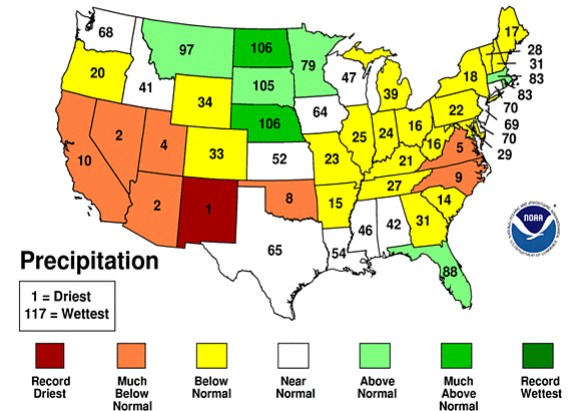
20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www>

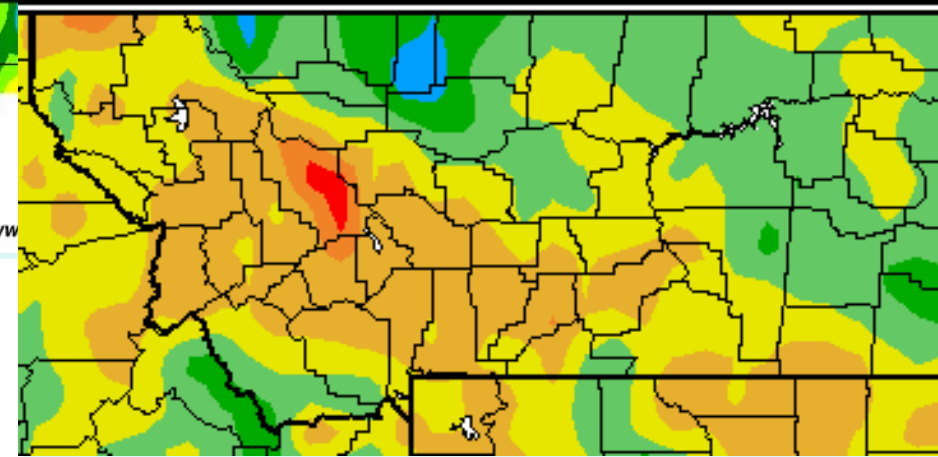
January 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA

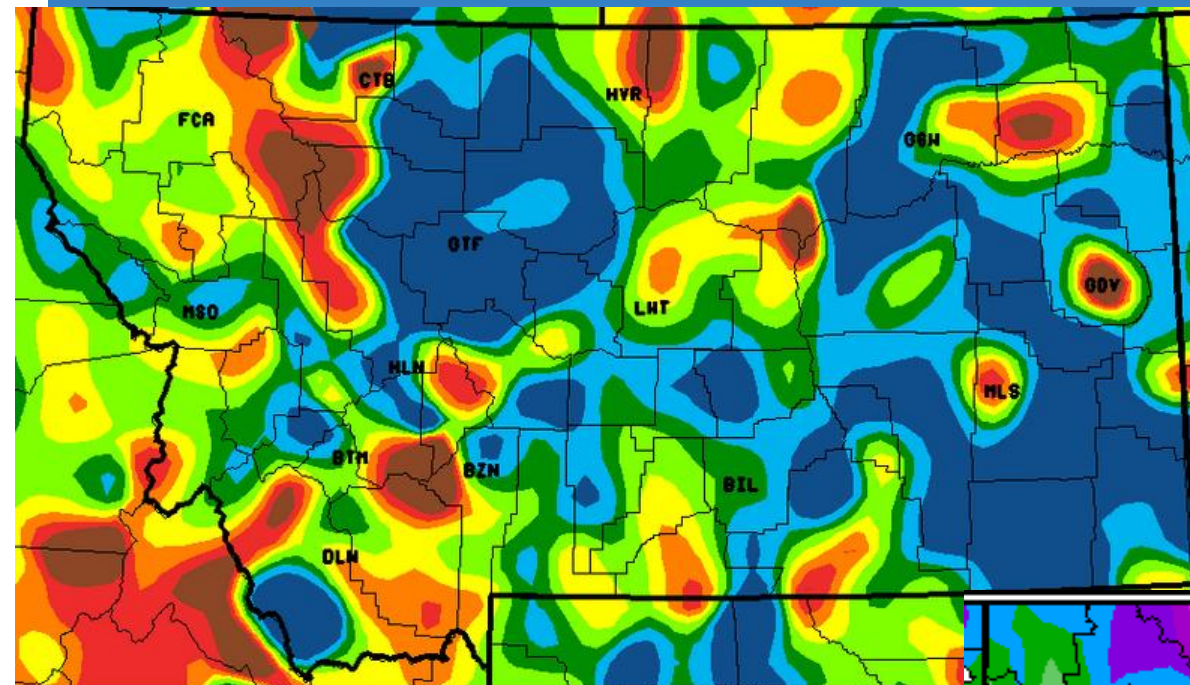


21st wettest, 97th driest

Departure from average
temperature



Percent of Normal Precipitation February 2011



February 2011 Percent of Normal Precipitation
Period of Normal: 1971-2000

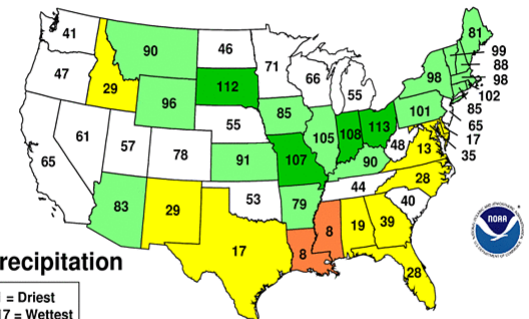
20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.>

February 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



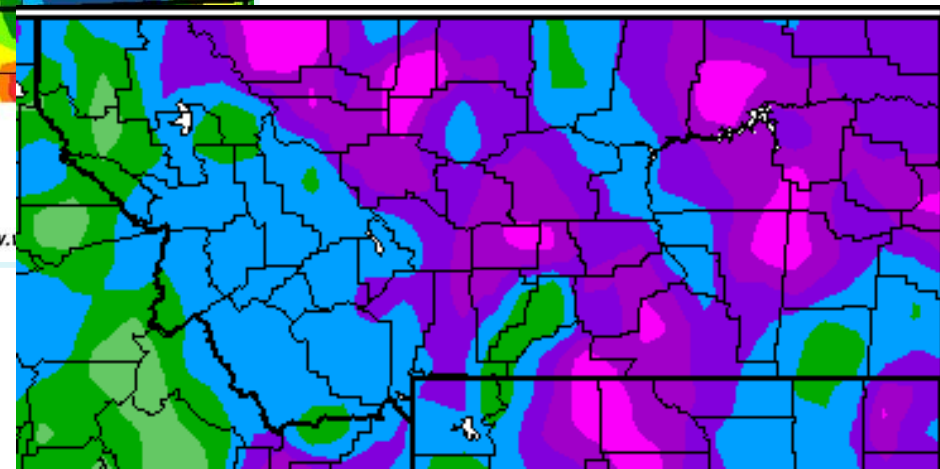
Precipitation

1 = Driest
117 = Wettest

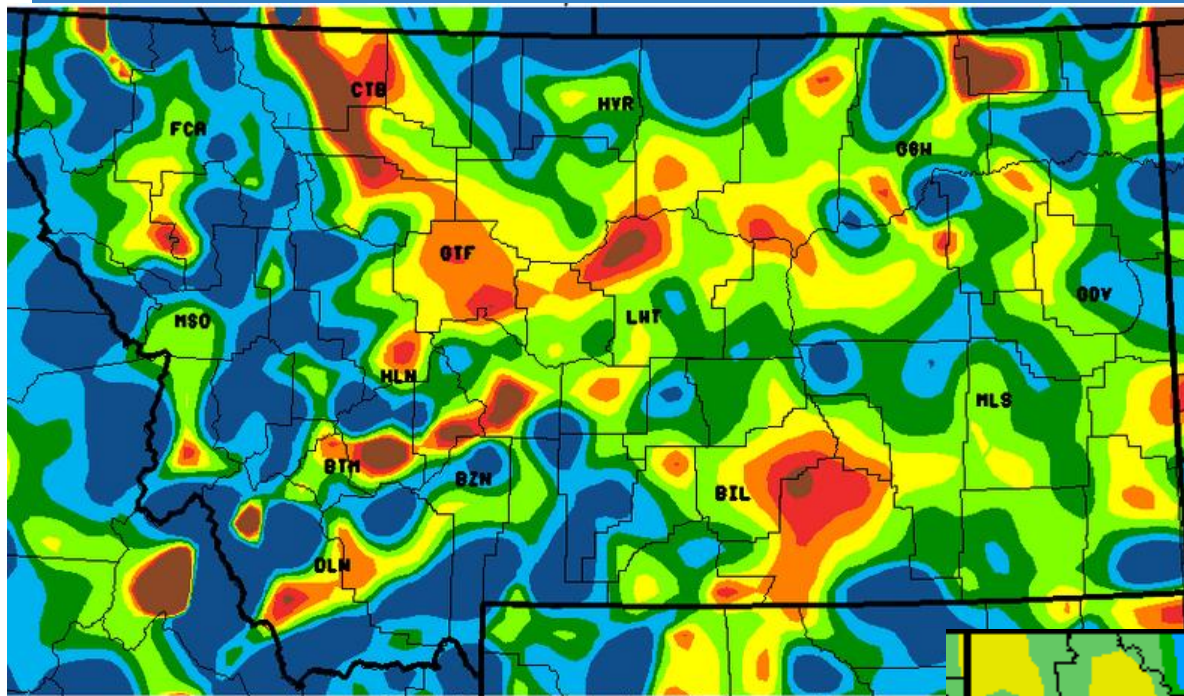


28th wettest, 90th driest

Departure from average
temperature



Percent of Normal Precipitation March 2011



March 2011 Percent of Normal Precipitation
Period of Normal: 1971-2000

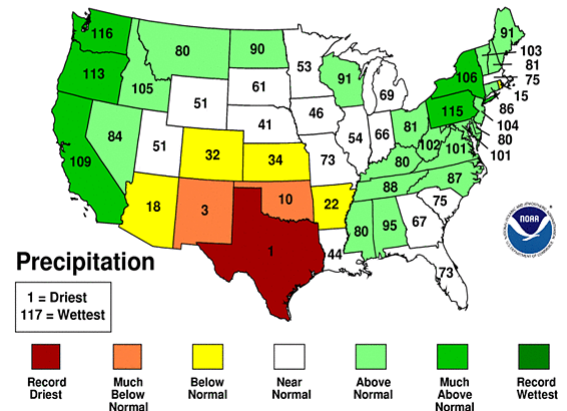
20 40 60 85 115 150 200

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<http://www>

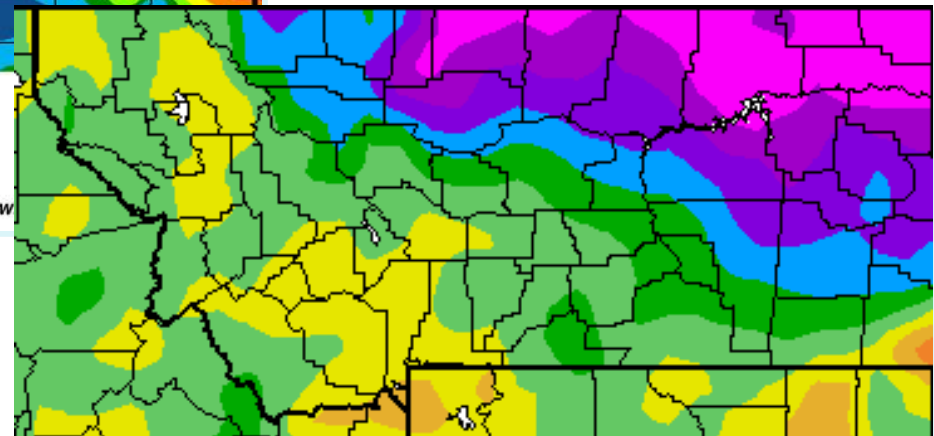
March 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA

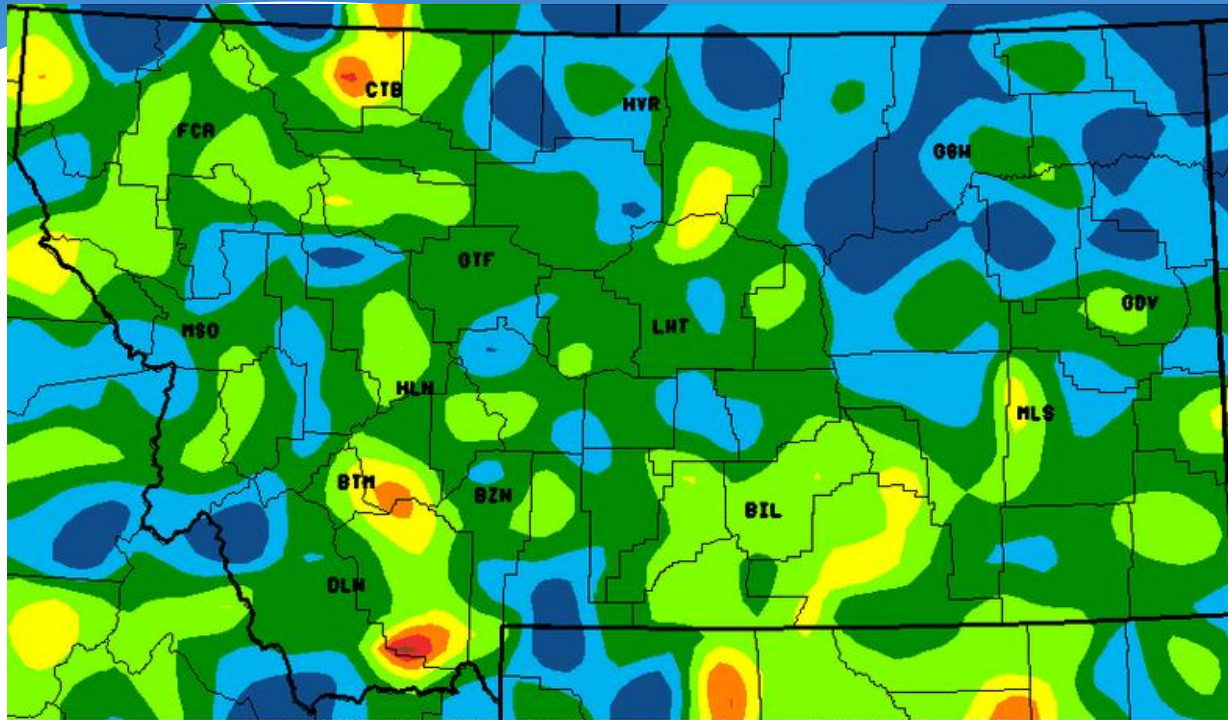


38th wettest, 80th driest

Departure from average
temperature



Percent of Normal Precipitation Water Year 2011



Oct 2010-Mar 2011 Percent of Normal Precipitation
Period of Normal: 1971-2000

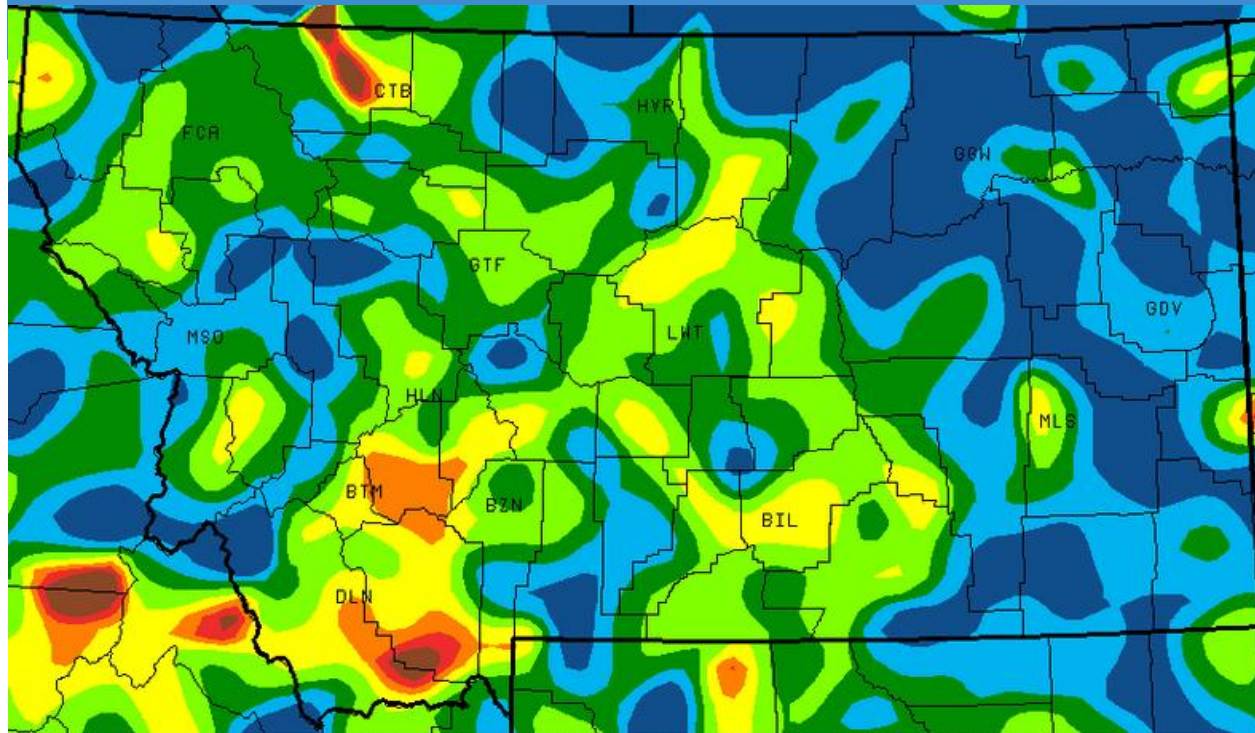
20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.wrh.noaa.gov/Greatfalls>

- * October – March
- * Virtually all of Montana averaging near to above normal
 - * Only a few isolated areas averaging below normal
 - * Northeast is well above normal

Percent of Normal Precipitation Calendar Year 2011



Jan-Mar 2011 Percent of Normal Precipitation

Period of Normal: 1971-2000

20 40 60 85 115 150 200

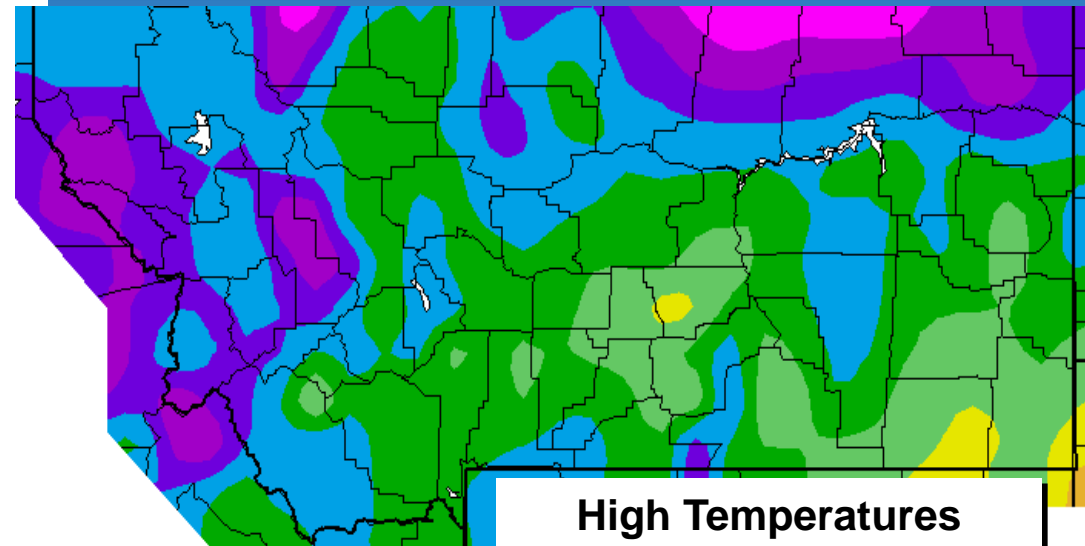
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<http://www.wrh.noaa.gov/Greatfalls>

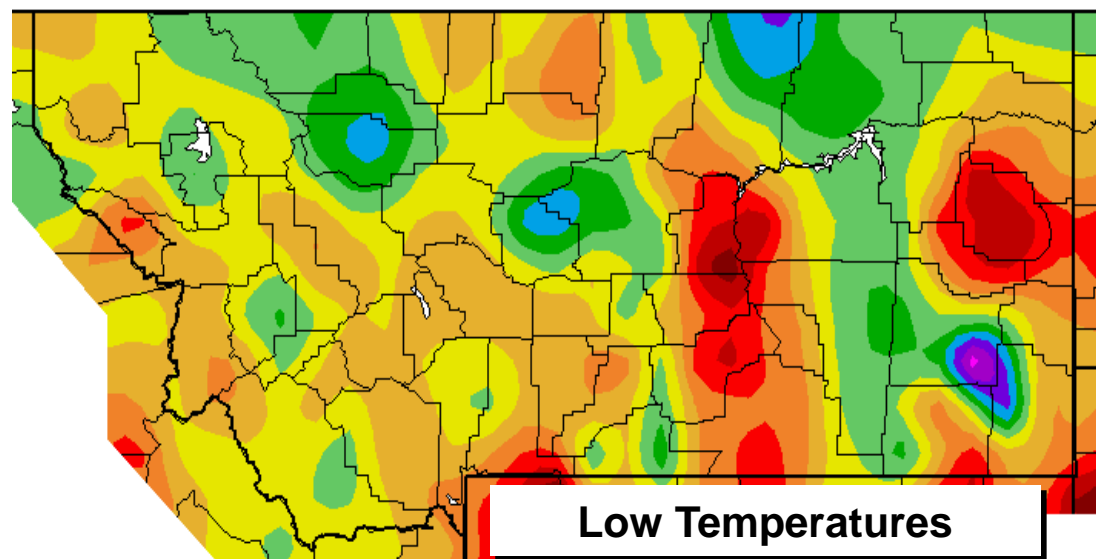
- * January – March
- * Most of Montana averaging near to above normal
 - * Scattered areas below normal – particularly southwest
 - * North central, northeast and southeast Montana well above normal

Temperature Anomalies

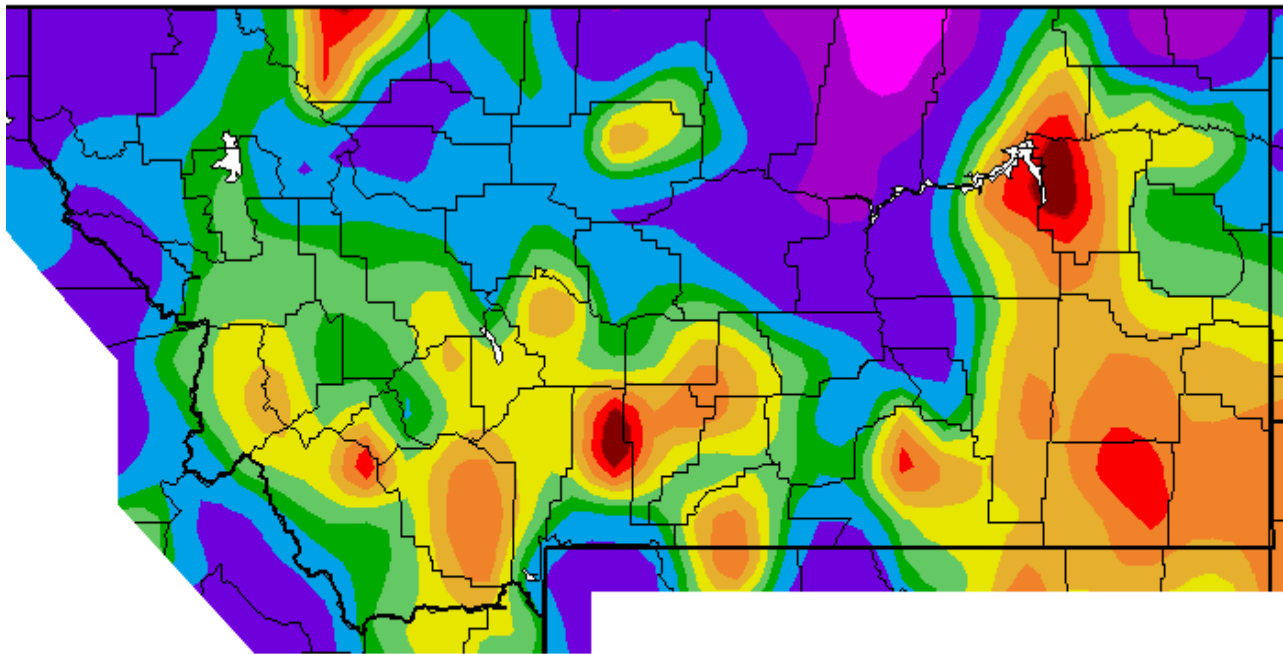
April 1 - 19



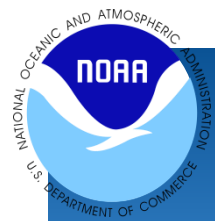
- * Temperatures averaging near to below normal
- * Highs
 - * West/north – 4-12 degrees below normal
 - * Central/southeast – Near normal
- * Lows
 - * Mostly near normal
 - * Areas 4 to 10 degrees above normal central and east



Percent of Average Precipitation April 1 – 17

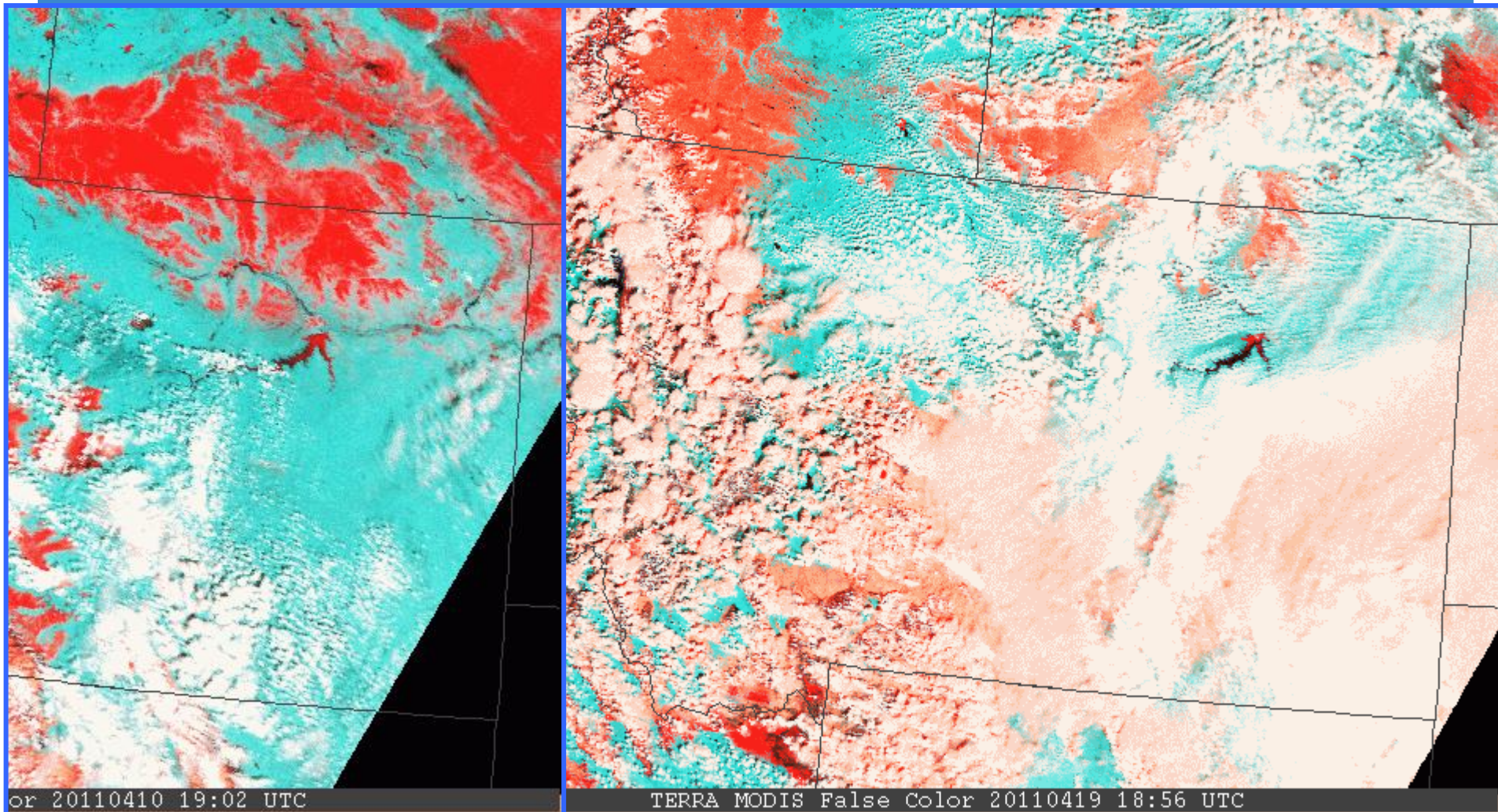


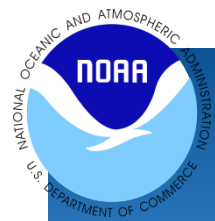
- * Well above normal over much of northern half of Montana
- * Near to well below normal across southern half of Montana



MODIS Satellite Imagery

April 10 and April 19





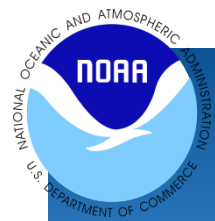
Hogeland – Harlem Road

April 14, 2011



- * **Snow Records**
- * **Glasgow 108", record 70.7"**
- * **Turner 61.4", record 48.3"**
- * **Gold Butte 119.3", record 94"**
- * **Many others**
- * **Canada!**

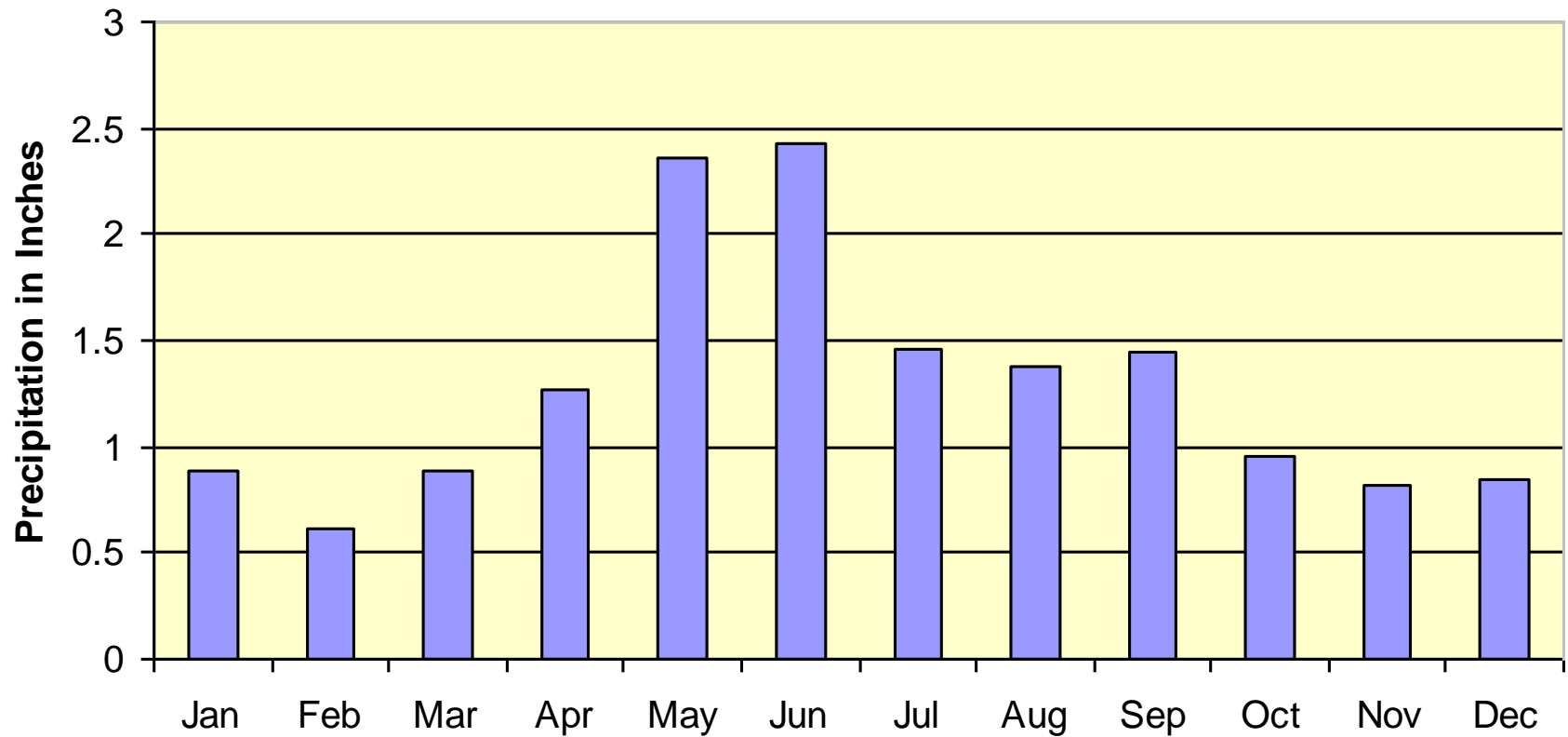
BIG SKY	175.3	5TH SNOWIEST	258.0	2007-08	258.0	2007-08
BOZEMAN MSU	103.5	5TH SNOWIEST	119.2	1941-42...	73.1..157.5	1996-97
CHESTER	67.9	SNOWIEST	63.2	2008-09...	23.0...85.0	2008-09
CASCADE 20SSE	55.4	2ND SNOWIEST	57.1	2003-04...	42.7...95.1	2003-04
CHINOOK	57.0	3RD SNOWIEST	58.0	1995-96...	33.2...63.0	1995-96
CHOTEAU	48.6	16TH SNOWIEST	72.0	1897-98...	24.4...90.0	1966-67
CONRAD	51.0	11TH SNOWIEST	75.5	1924-25...	31.3...82.0	1934-35
EAST GLACIER	163.9	22ND SNOWIEST	268.0	1971-72..	142.0..284.0	1971-72
FT ASSINIBOINE	51.2	SNOWIEST	42.8	2008-09...	28.0...50.1	1989-90
FORT BENTON	68.1	21ST SNOWIEST	114.1	1958-59...	43.1..114.1	1958-59
GALATA	61.8	SNOWIEST	58.5	2008-09...	91.5	2008-09
GOLD BUTTE	119.3	SNOWIEST	94.0	2008-09...	56.0..127.0	2006-07
GRASS RANGE	61.9	9TH SNOWIEST	102.2	1958-59...	35.8..118.0	1958-59
GREAT FALLS	87.6	2ND SNOWIEST	92.9	1988-89...	51.2..120.2	1988-89
HARLEM	61.5	2ND SNOWIEST	67.3	1964-65...	25.0...68.2	1964-65
HAVRE	73.7	SNOWIEST	72.2	1977-78...	30.8...93.4	1981-82
HOBSON	79.5	SNOWIEST	74.9	2009-10...	45.0...92.9	2009-10
LEWISTWN 11SE	113.8	11TH SNOWIEST	198.0	1977-78..	109.0..207.4	1977-78
MILLEGAN 14SE	174.0	2ND SNOWIEST	175.0	2009-10..	108.6..179.0	2007-08
MOCCASIN	54.2	14TH HIGHEST	120.0	1977-78..	63.7..121.0	1977-78
NEIHART	117.6	6TH SNOWIEST	184.0	1965-66...	84.8..156.0	1981-82
SHELBY	40.5	4TH SNOWIEST	57.5	1948-49...	32.0...68.2	2008-09
SIMPSON	91.9	SNOWIEST	51.1	1951-52...	24.5...61.8	1966-67
STANFORD	56.2	15TH SNOWIEST	79.7	1971-72...	50.0..118.4	1974-75
TURNER	61.4	SNOWIEST	48.3	1985-86...	22.6...53.8	2003-04
WARRICK	101.3	SNOWIEST	76.5	2005-06...	55.5..107.2	2009-10
W YELLOWSTONE	188.1	11TH SNOWIEST	284.2	1994-95..	128.6..316.6	1994-95
W SULPHUR SPGS	52.4		128.5	1947-48..	27.0..142.5	1963-64



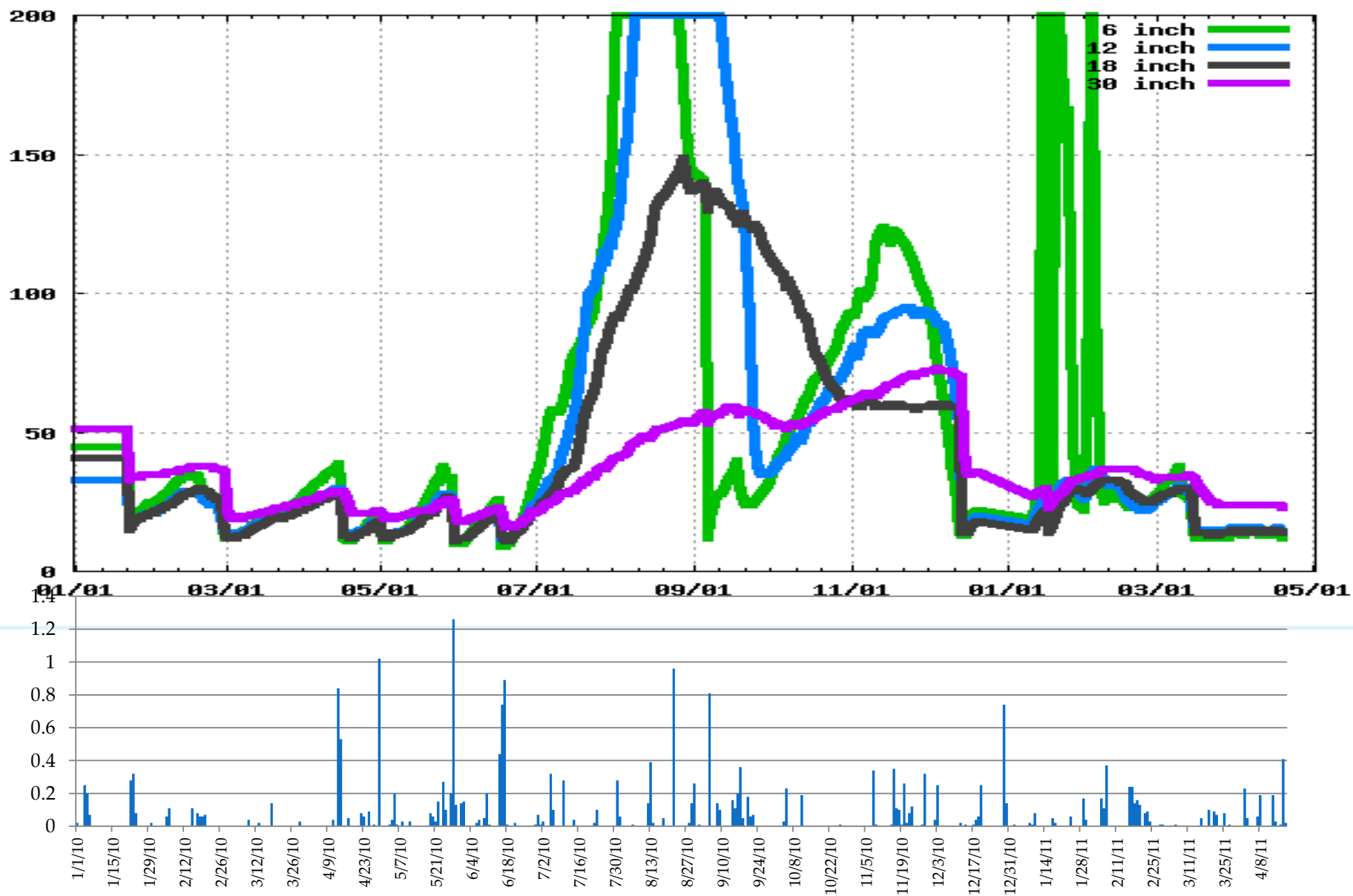
Statewide Average Precipitation

April begins increase of spring precipitation

Statewide Average Precip



Great Falls Soil Moisture

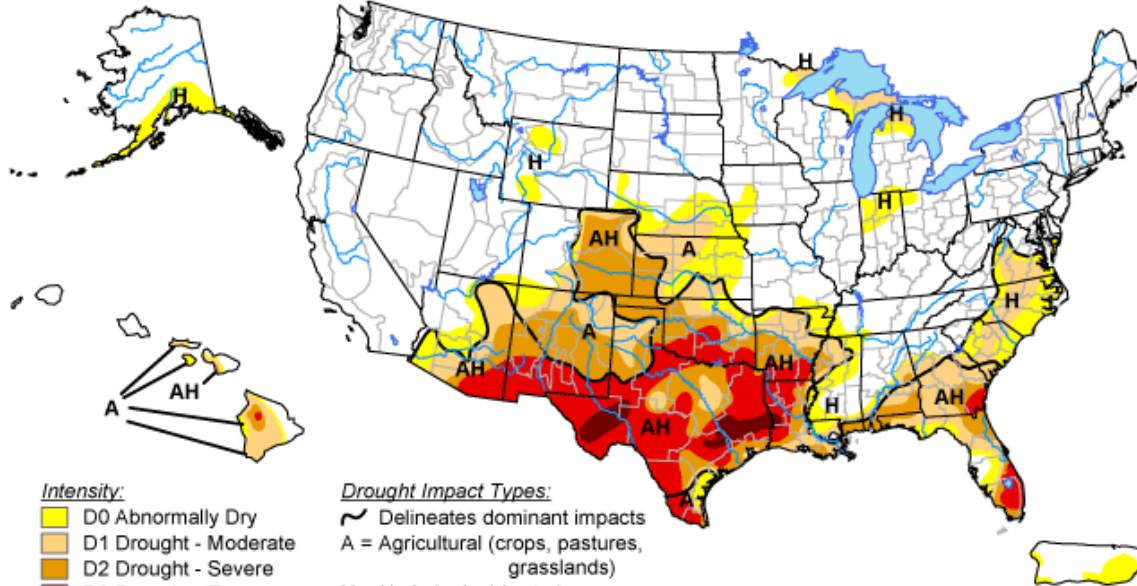


National Drought Monitor

Issued April 12, 2011

U.S. Drought Monitor

April 12, 2011
Valid 8 a.m. EDT



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying forecast statements.

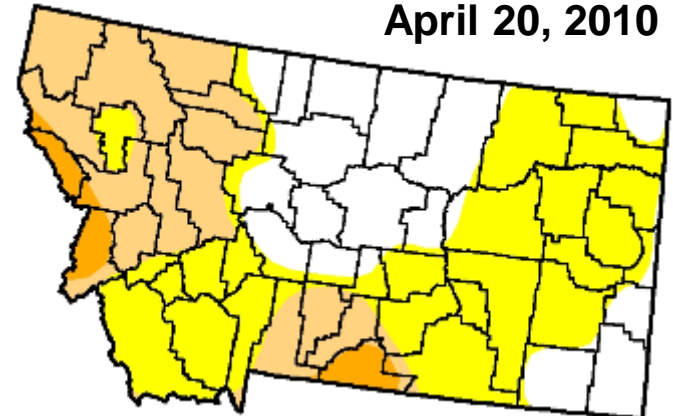
<http://drought.unl.edu/d>

* Montana void of any drought classifications

April 12, 2011

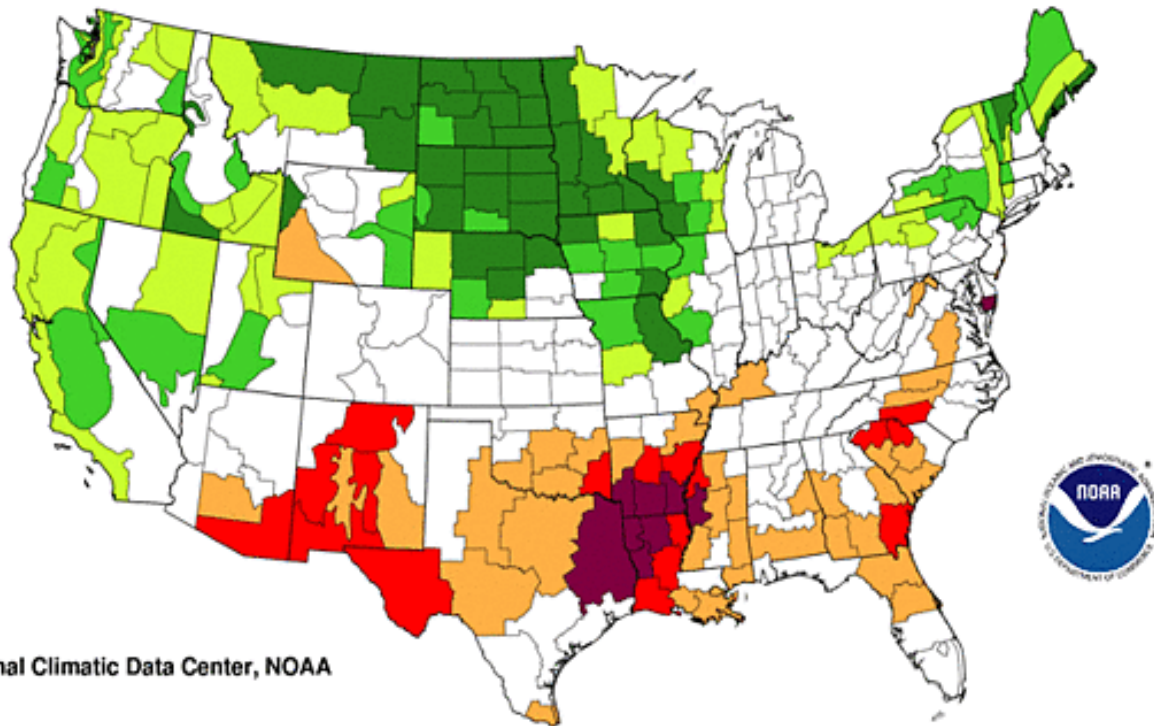


April 20, 2010



Palmer Hydrological Drought Index

March 2011

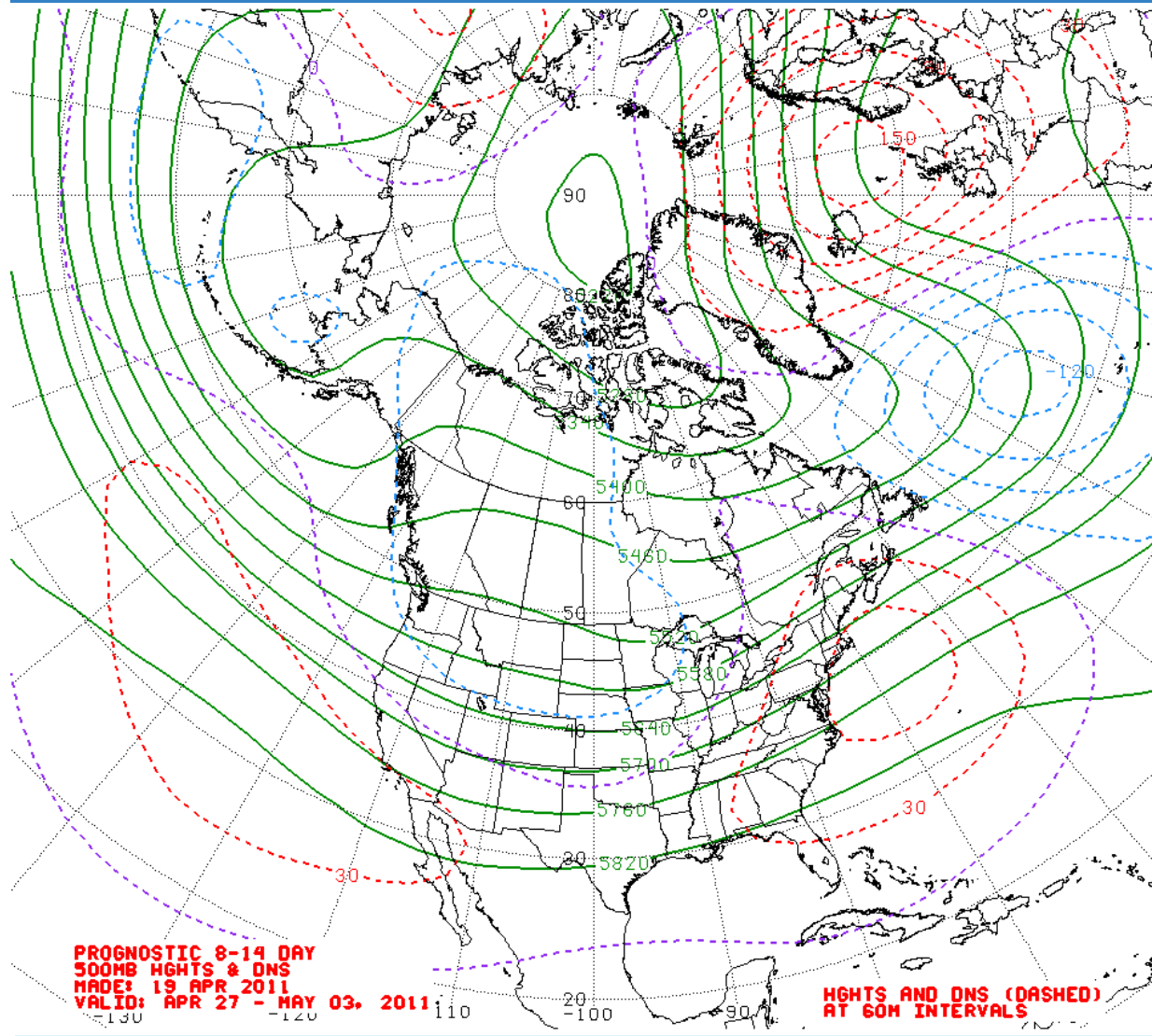


National Climatic Data Center, NOAA



- * 'Extremely Moist'
 - * North central
 - * Northeast
 - * Southeast
- * 'Moderately Moist'
 - * West
 - * Central
- * 'Mid-Range'
 - * Southwest
 - * South central

8 to 14 Day Outlook 500mb Heights and Anomalies

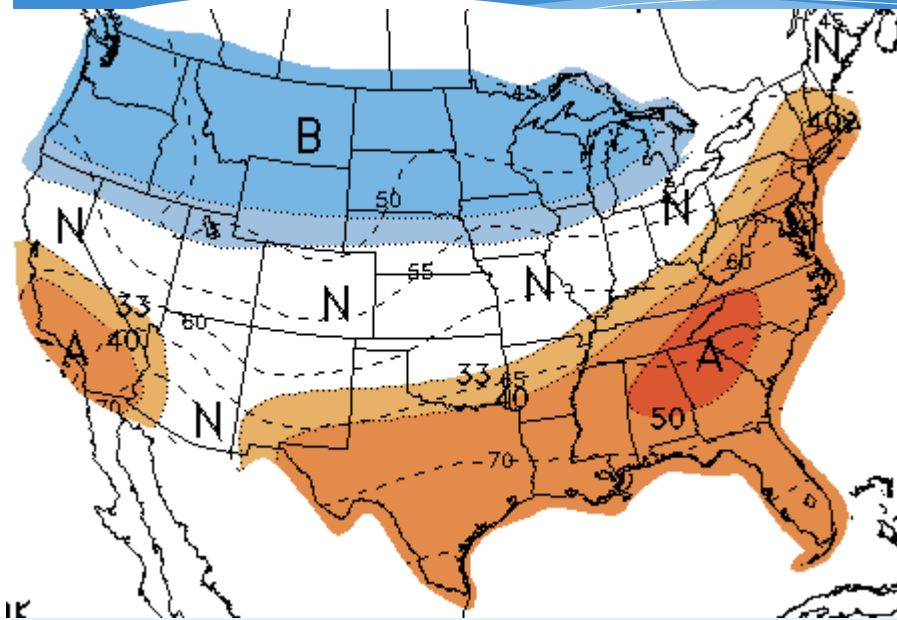


- * Westerly flow into western U.S.
- * Split in flow over Montana less dramatic

8 to 14 Day Outlook – Temperatures

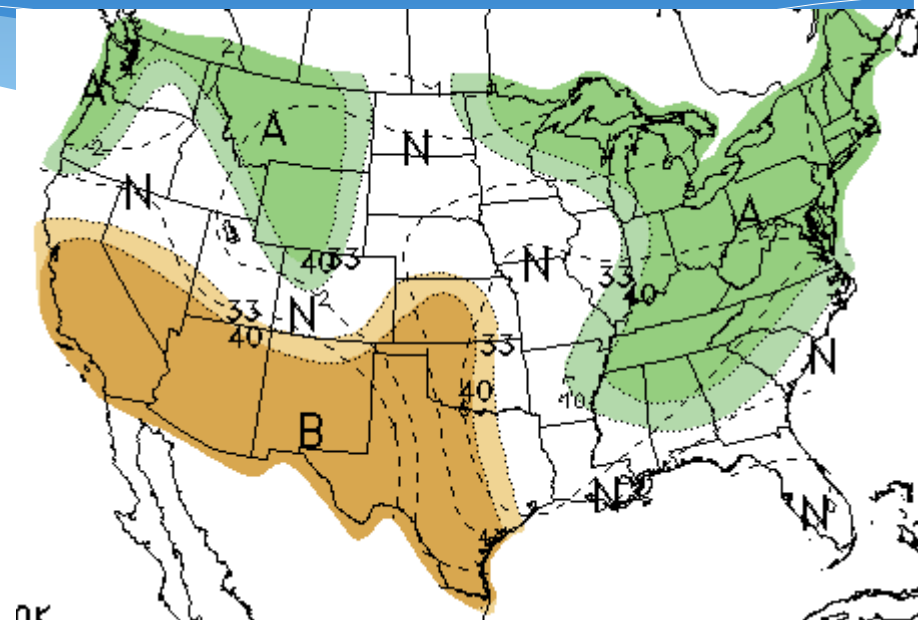
April 27 – May 3

Temperature

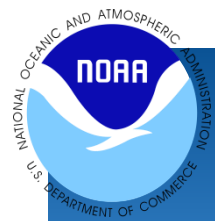


- * 50% to 60% chance temperatures will be below normal across Montana
- * Averages
 - * Highs – 50s
 - * Lows – 30s to lower 40s

Precipitation

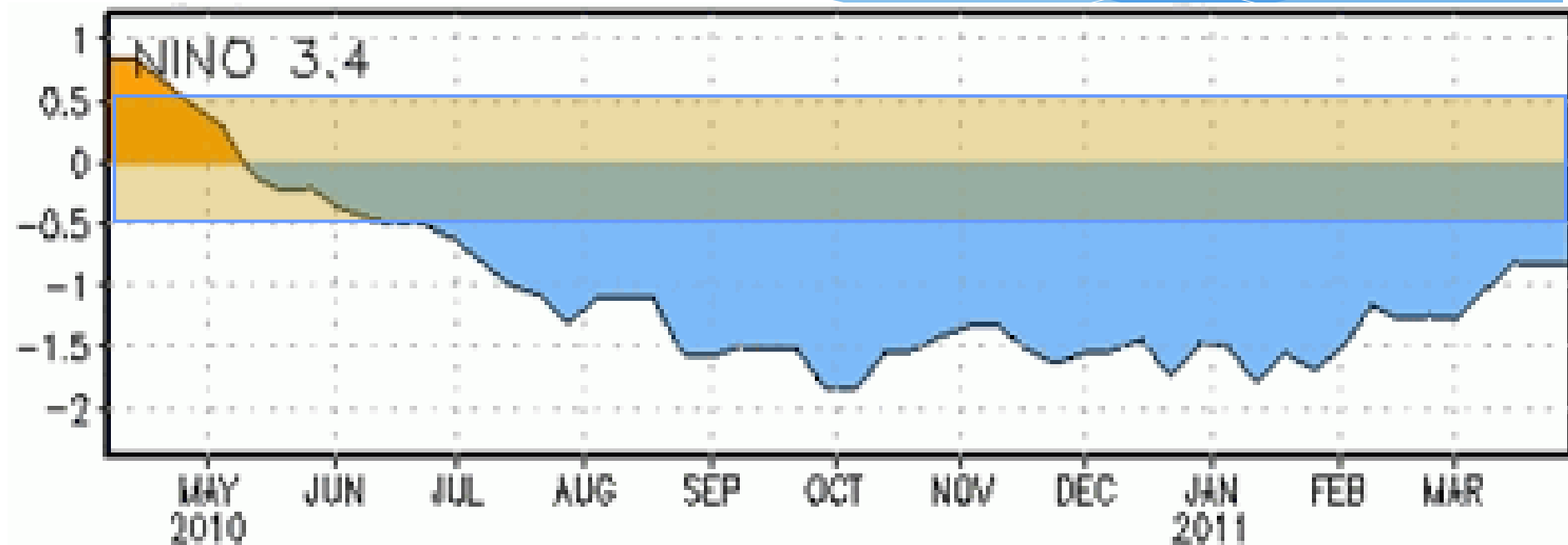


- * 40% to 50% chance precipitation will be above normal west and central
- * 33% to 40% chance precipitation will be above normal east
- * Averages – 1" – 1.5" on the plains

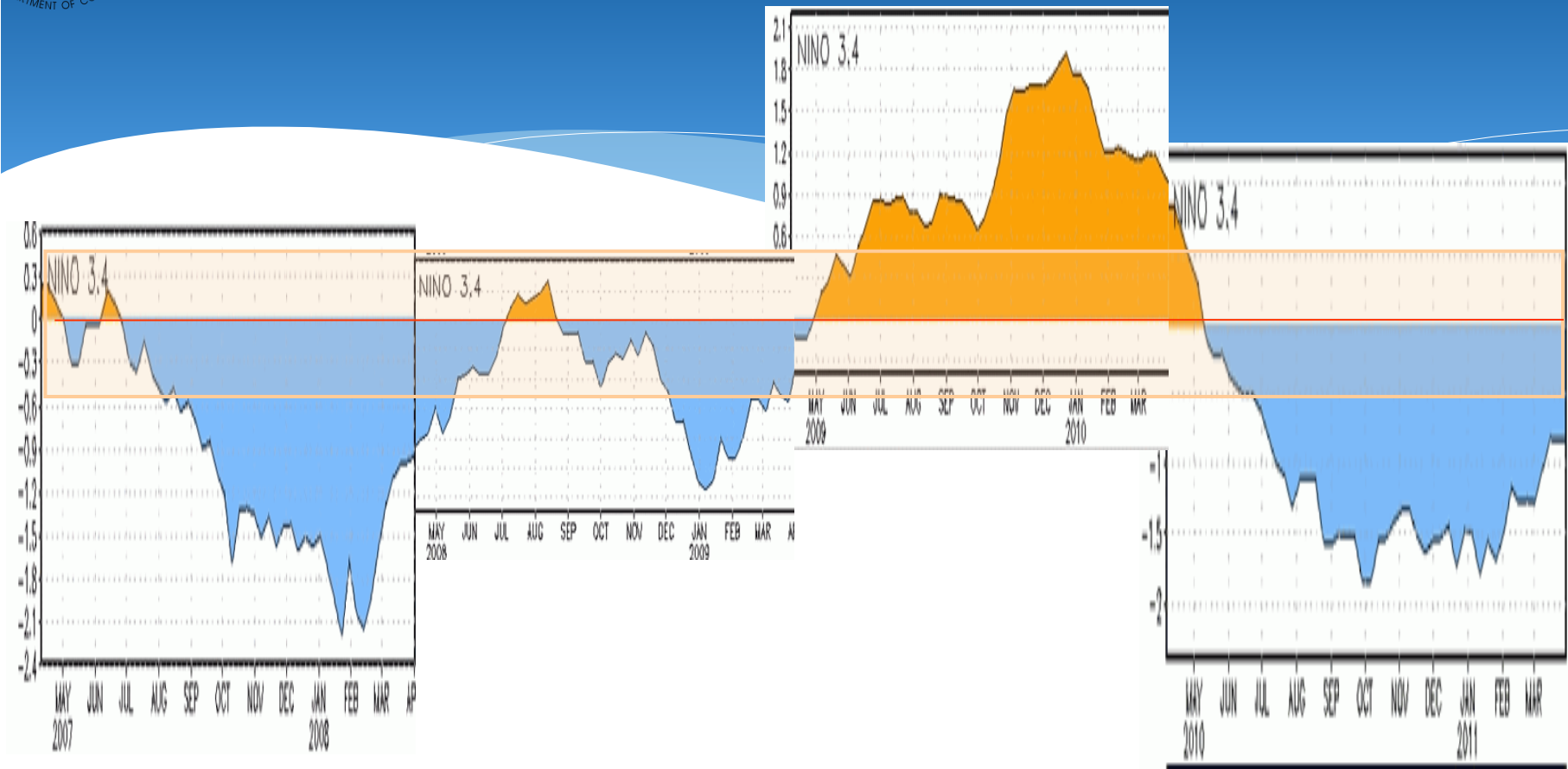


El Niño / La Niña

- * A transition to ENSO-neutral conditions is expected by June 2011

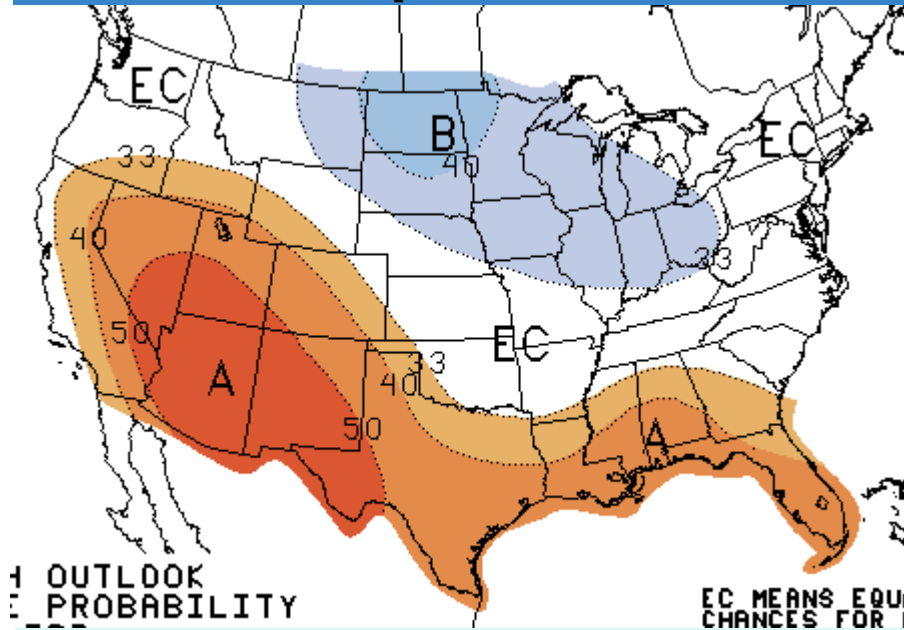


El Niño / La Niña – 4 Year Trend



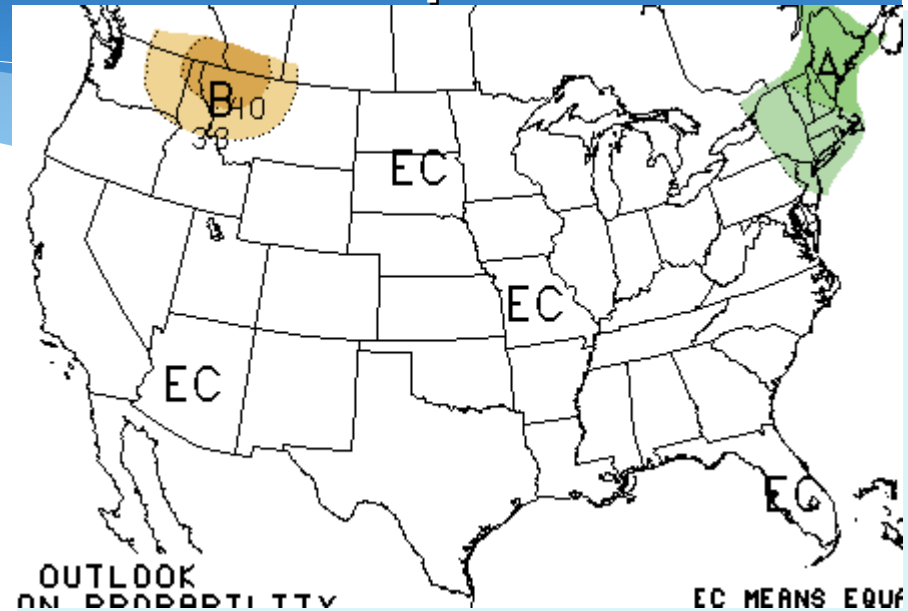
May – July Outlook

Temperature



- * 33% to 40% chance temperatures will be below normal across eastern Montana
- * Equal chances temperatures will be above, below or near normal over west and central Montana

Precipitation



- * 33% to 50% chance precipitation will be below normal over northwest Montana
- * Equal chances precipitation will be above, below or near normal over southwest, central and eastern Montana

Drought Outlook through June

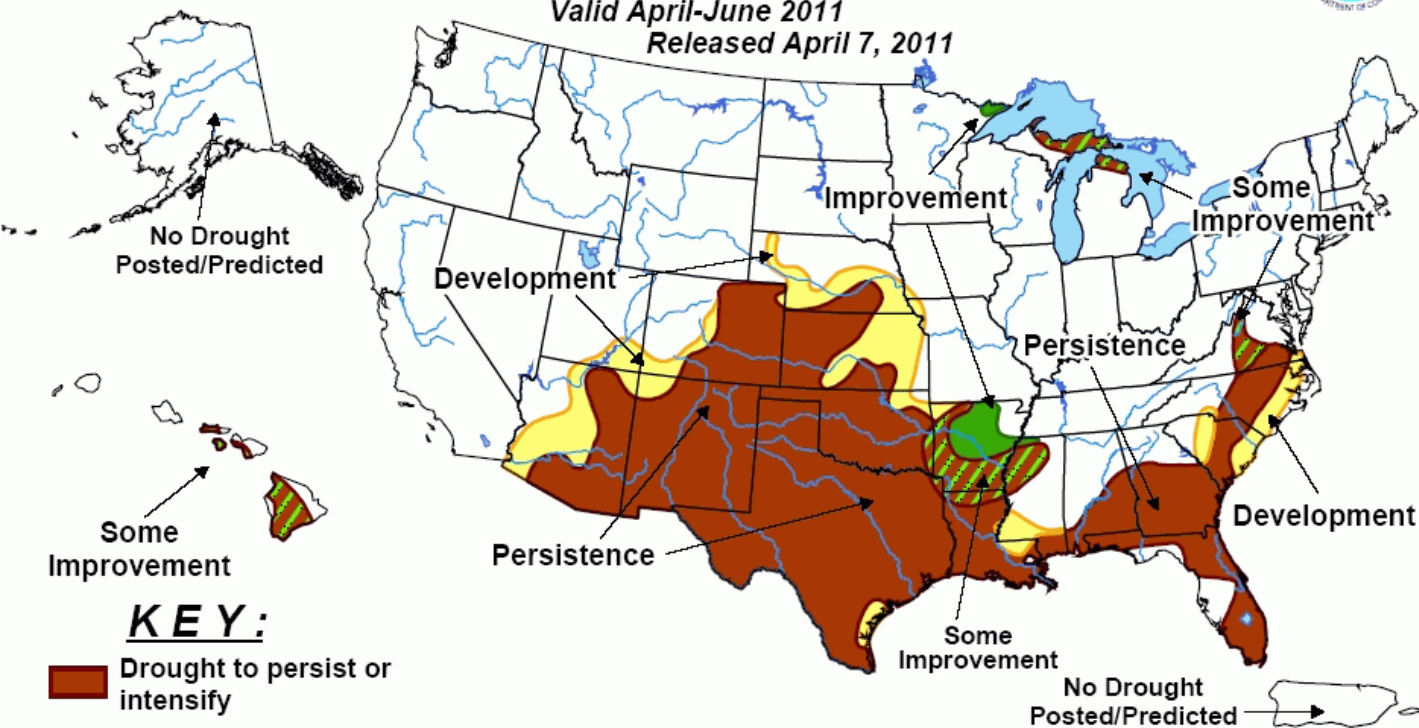
Issued April 7, 2011

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid April-June 2011

Released April 7, 2011



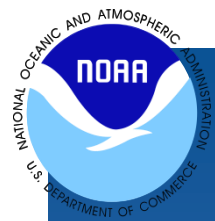
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

* No drought development forecast for Montana through June

In Summary...

- * Montana has experienced below normal temperatures and above normal precipitation (SNOW!) across most of the state since fall of 2010
- * The Milk River is experiencing moderate to major flooding as a result of the above normal precipitation and snowmelt
- * Northern Montana still has snow cover – flooding will persist into May
- * Forecast calling for continued cool temperatures with better chances for above normal precipitation into early May





weather.gov

weather.gov/billings

weather.gov/glasgow

weather.gov/missoula

weather.gov/greatfalls



Sullivan Park - Glasgow
April 16, 2011